



Provincial needs and how stakeholders can contribute towards local health technology needs

LOCAL ICONS

Christiaan Barnard
(first human heart transplant)



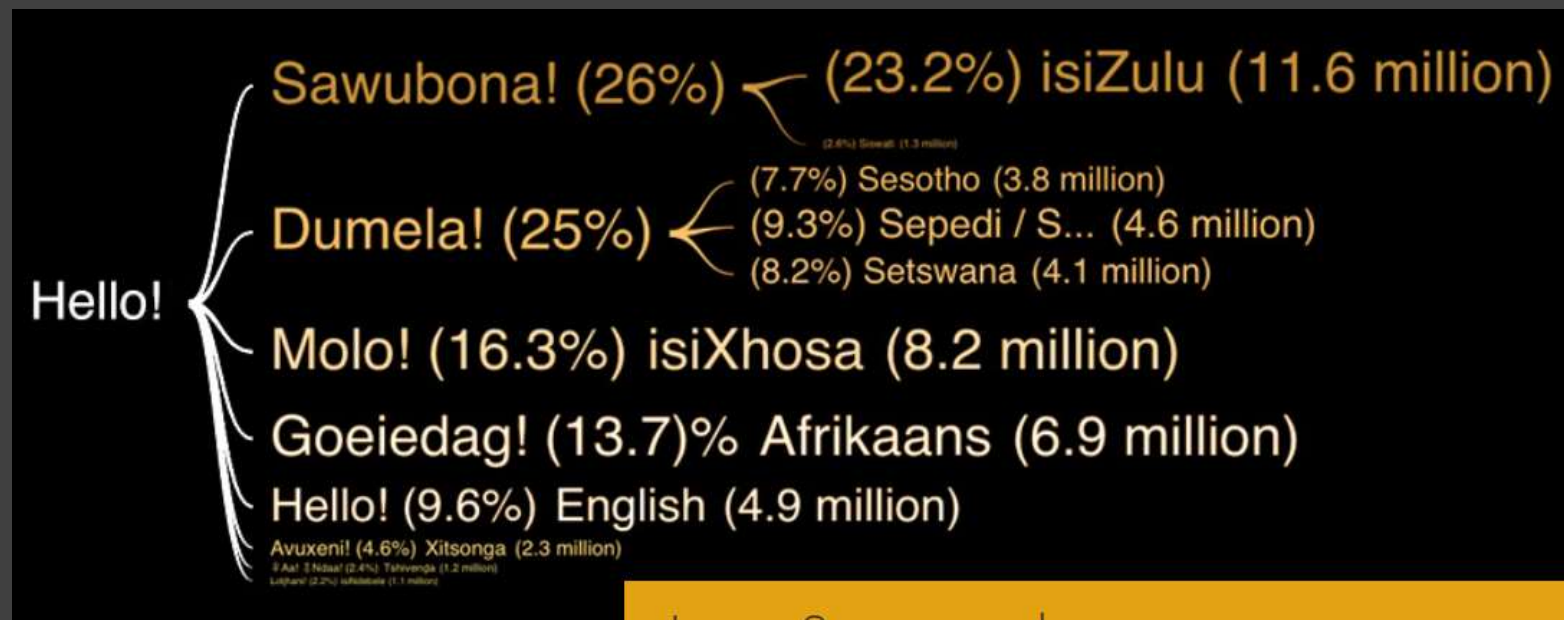
Nelson Mandela & Desmond Tutu (Nobel Peace Prize Laureates)



Alan Cormack (Nobel Prize for Medicine – CT Scanner)



South Africa



Population circa 55-m

11 official languages

All religions

South Africa

Quadruple Burden of Disease:

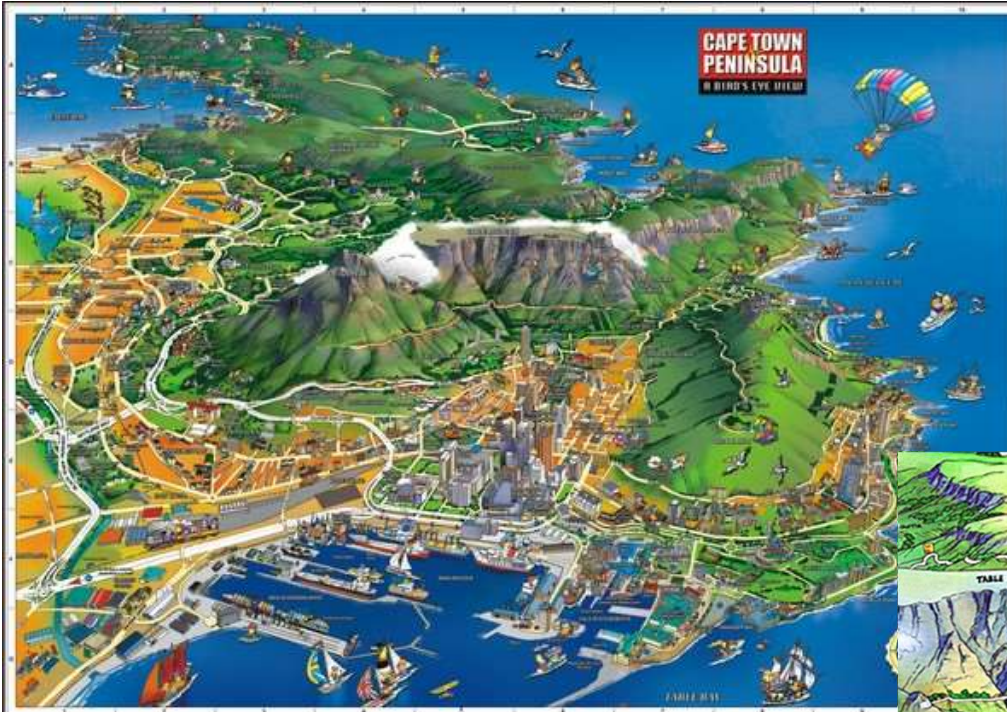
- HIV/AIDS (co-joint with TB)
- Tuberculosis (incl. MDR, XDR & TDR-TB)
- Non-Communicable Diseases
- Injuries (Violent Crime & Road Accidents)

(pro-rata, South Africa tops the charts for 3 of the above)

Poverty: highest Gini disparity coefficient in world; unemployment (>30%), legacies of apartheid, cancer of corruption and low economic growth

Deprivation Cluster: Migration, Overcrowding, Malnutrition and Poverty





Western Cape

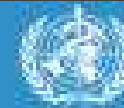
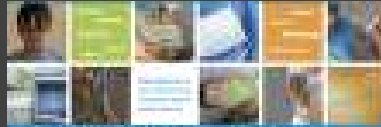
“The fairest Cape in all the world” but

...highest murder rate and TB prevalence in the world



Provincial needs and how stakeholders can contribute towards **local health technology needs**

- MORE lean drinking water, effective sanitation, waste removal, clean environment, safe housing, safe roads
- LESS alcohol, sugar, tik, tobacco (behaviour modification)
- All upstream health-related technology interventions –Whole of Society Approach (WOSA)
- Less known: emerging diseases; climate change
- Known unknowns: future budget allocations, programme sustainability (e.g. HFRG, TSG); political stability; NHI resourcing and implementation



World Health
Organization

WHO/EIP/PAU Medical Devices

Second Global Forum on Medical Devices (Geneva 22-24 Nov. 2012)

Title: Compendium of innovative health technologies for low-resource settings

Objectives

Raise awareness of the pressing need for appropriate design solutions.

Encourage dialogue between ministries of health, procurement officers, donors, technology developers, health care professionals.

Methodology

Reach out to innovators from all over the world, especially low-resource settings

Evaluation by external experts

Publication of "promising" medical devices on WHO website, publically available

Criteria for selection: medical device has the potential to improve health outcome superior effectiveness, enhanced ease of use and maintenance, reduced or no training requirements, labor saving, improved safety level for user, patient, environment, increased social and cultural acceptability, reduced resource requirements (such as independent of electricity or clean water supply), technical superiority, improved accessibility, better cost-effectiveness and affordability



**World Health
Organization**

Local Production and Technology Transfer to Improve the Access to Medical Devices in Low- Resource Settings

Second WHO Global Forum on Medical Devices

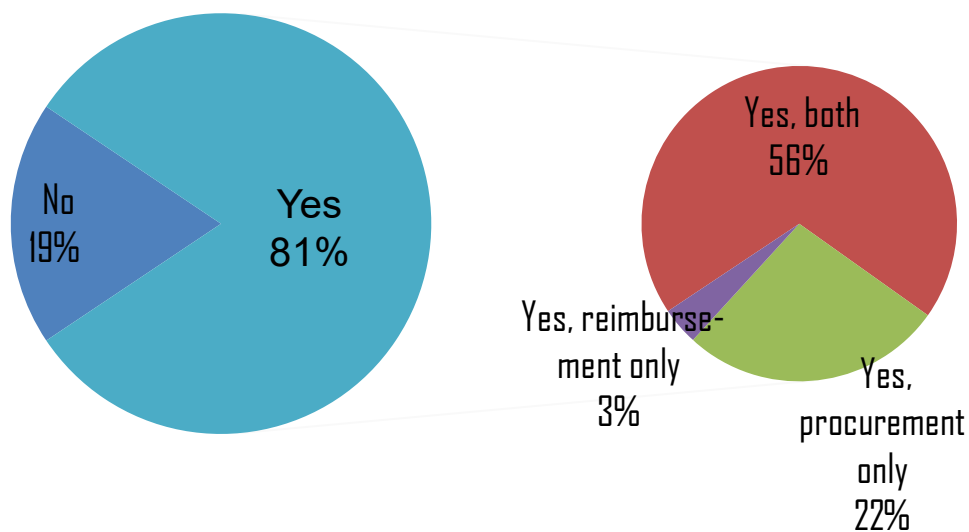
Geneva, Switzerland

22 November 2013

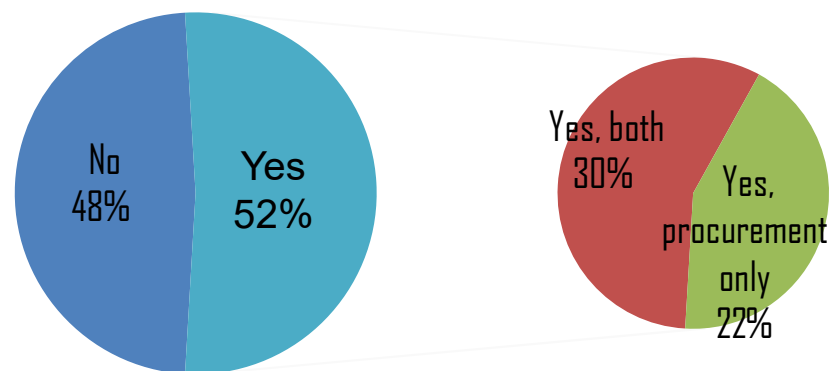


Inclusion of locally produced medical devices in procurement and reimbursement lists

Non-African countries (total responses: 32)

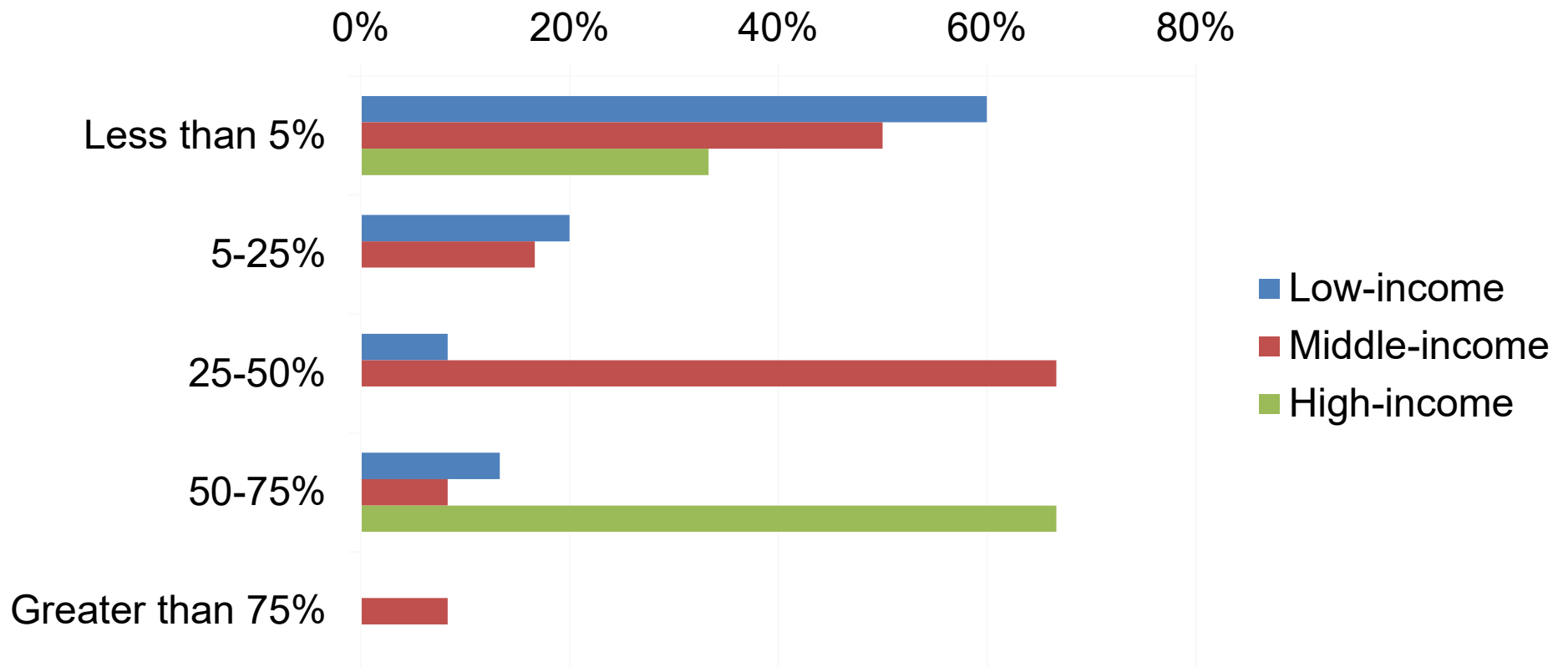


African countries (total responses: 27)

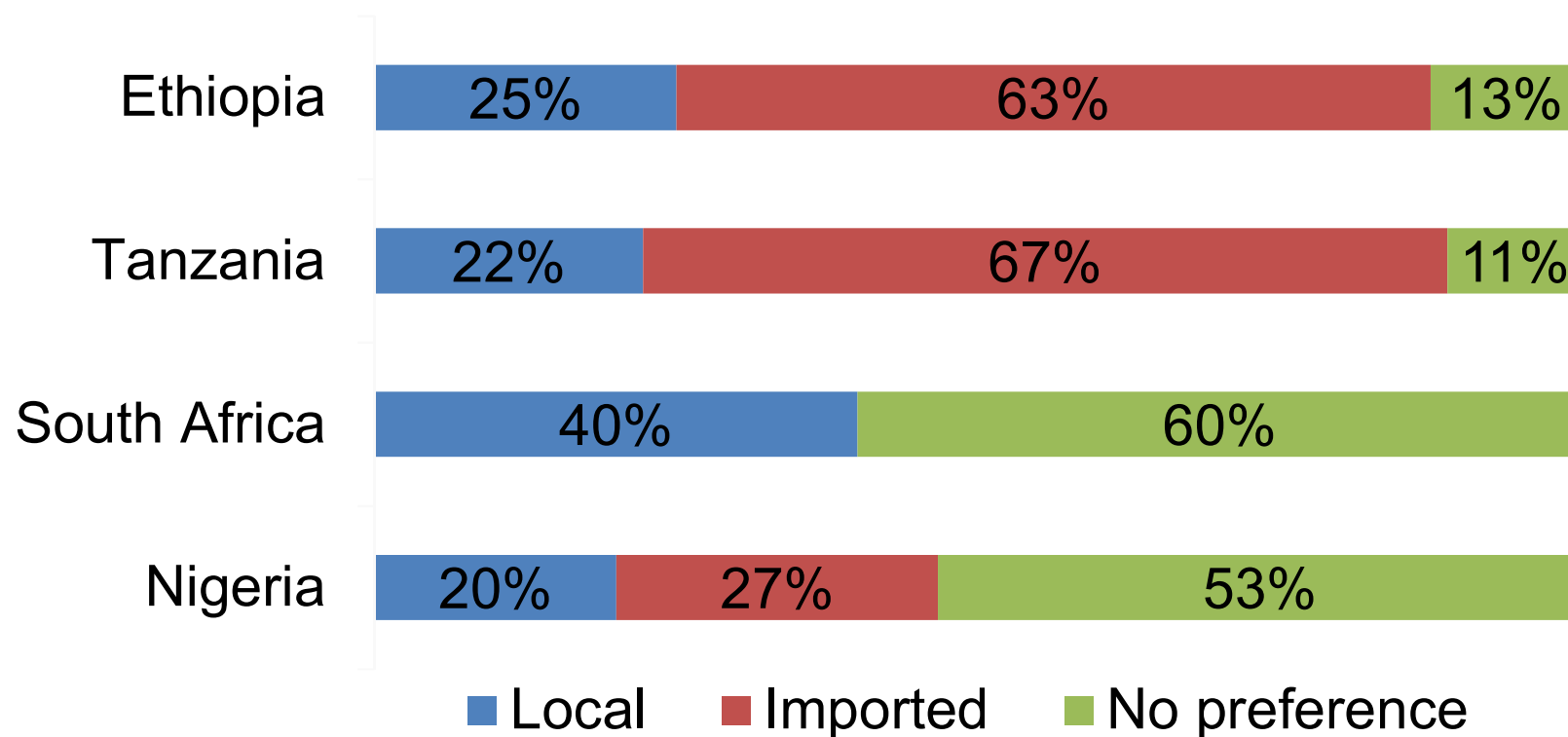


% of inventory manufactured nationally

Percentage of inventory manufactured nationally versus internationally (total responses: 30)



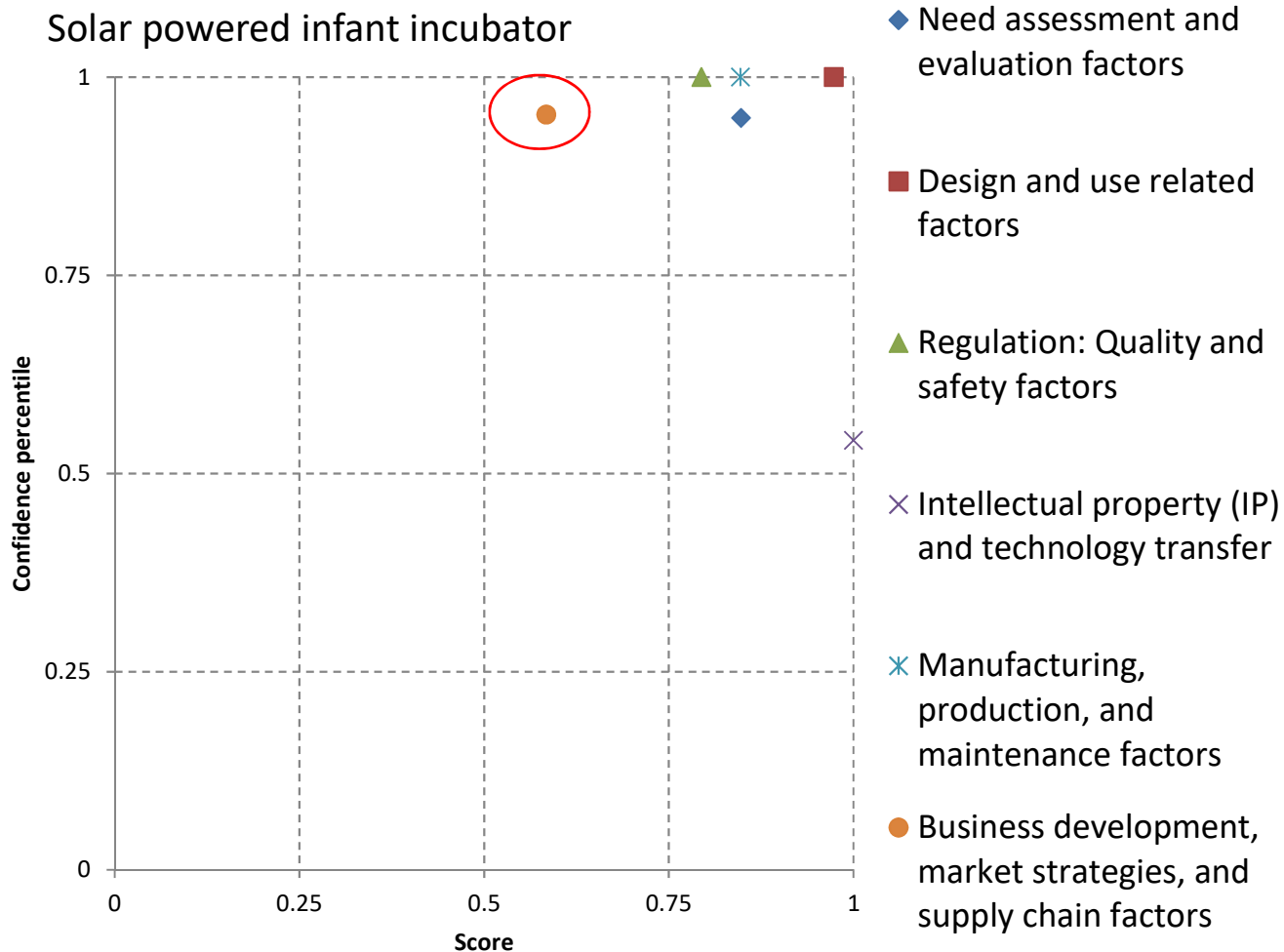
Preference in using a local or imported medical device



Total responses: 37



Feasibility Tool - sample analysis



Procure what? (proxy for need)

Item	Envisaged date of advertising	Envisaged date: payment	Method of procurement (e.g. Limited Bid/Open)	Amount	Estimated unit price	Total Estimated cost
MONITORS & CENTRAL STATION	10/07/2018	15/03/2019	BUY-OUT	17	219,997	3739,997
AUTOMATIC STAINER AND COVER SLIPPER	10/07/2018	30/02/2019	BUY-OUT	1	3499,997	3499,997
VENTILATORS	10/07/2018	15/03/2019	BUY-OUT	8	319,997	2559,997
AUTOMATIC IMMUNOSTAINER STATION STAINER	10/07/2018	15/03/2019	BUY-OUT	1	2011,708	2011,708
AUTOMATION ROBOT FOR DNA CE SETUP	10/07/2018	15/03/2019	BUY-OUT	1	1999,997	1999,997
CRIBS	10/07/2018	15/03/2019	BUY-OUT	11	149,997	1649,997
CT 3D IMAGE INTENSIFIER (C-ARM)	10/07/2018	30/02/2019	BUY-OUT	1	1499,997	1499,997
RO WATER SYSTEM	10/07/2018	15/03/2019	BUY-OUT	1	1499,997	1499,997
DEFIBRILLATOR, AUTOMATIC	10/07/2018	30/02/2019	BUY-OUT	10	139,997	1399,997
CO2 LASER	10/07/2018	15/03/2019	BUY-OUT	1	1384,109	1384,109
SPINE TABLE	10/07/2018	15/03/2019	BUY-OUT	1	1299,997	1299,997
X-RAY IMAGING SYSTEM (FOR GENERAL X-RAY ROOM), WITH STATIONARY TABLE, COLLIMATOR	N/A - CONTRACT	30/08/2018	WCDOH CONTRACT	1	1299,997	1299,997
ANAESTHESIA WORKSTATION MACHINE +	10/07/2018	30/02/2019	BUY-OUT	2	599,997	1199,997
LIGHT EXAMINATION WALL MOUNTED	10/07/2018	15/03/2019	BUY-OUT	6	199,997	1199,997

	Project Number	SP	Institution	Item	Envisaged date of advertising	Envisaged date of payment	Method of procurement (e.g. Limited Bid/Open)	Amount	Estimated unit price	Total Estimated cost
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	FRIDGE SINGLE DOOR WITH TRAY UNDERNEATH FREEZE COMPARTMENT - MEDS & STAFF WARDS -	20/02/2018	20/02/2019	BUY-OUT	1	3,597	3,597
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	FURNITURE AS PER SITE MEETING	N/A - CONTRACT	23/11/2019	WCDOH CONTRACT	1	96,569	96,569
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	GLUCOMETER	01/08/2018	23/11/2018	BUY-OUT	2	0,597	1,197
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	HANDLE FIBRE GLASS - GREEN & OMNI SWEEP BROOM PLASTIC BLOCK 450MM	10/06/2018	30/08/2018	BUY-OUT	1	0,237	0,237
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	HB METER ELECTRONIC / HEMACUE	N/A - CONTRACT	30/08/2018	WCDOH CONTRACT	1	5,757	5,757
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	HUMIDIFIER FOR FLOWMETER	10/06/2018	30/08/2018	BUY-OUT	14	0,597	8,397
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	HUMIDIFIER FOR FLOWMETER	01/08/2018	23/11/2018	BUY-OUT	6	0,597	3,597
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	INSTRUMENT SET EMERGENCY TROLLEY	10/06/2018	30/08/2018	BUY-OUT	1	11,997	11,997
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	INTRODUCER BOUGIE	N/A - CONTRACT	30/08/2018	WCDOH CONTRACT	4	0,237	0,957
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	LADDER 5 STEP (FOR CLEANING WINDOWS, ETC.)	01/08/2018	23/11/2018	BUY-OUT	4	3,597	14,397
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	LARYNGOSCOPE SET WITH SET OF 4 MACINTOSH AND 2 MILLER BLADES (ADULT, PEADS)	01/08/2018	23/11/2018	BUY-OUT /STANDARDISE / LIMITED BIDDING	1	9,597	9,597
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	LIGHT EXAMINATION WALL MOUNTED LED	01/08/2018	23/11/2018	BUY-OUT	12	11,997	143,997
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	LINBIN 190X105X75MM	10/06/2018	30/08/2018	BUY-OUT	10	0,117	1,197
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	LINBIN 210X140X130	10/06/2018	30/08/2018	BUY-OUT	20	0,117	2,397
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	LINBIN 280X140X130	01/08/2018	23/11/2018	BUY-OUT	10	0,117	1,197
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	LINBIN 375X210X180	10/06/2018	30/08/2018	BUY-OUT	10	0,117	1,197
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	LINBIN 375X420X180	10/06/2018	30/08/2018	BUY-OUT	6	0,117	0,717
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	MACHINE SCRUBBING/ BUFFING	10/06/2018	30/08/2018	BUY-OUT	1	26,397	26,397
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	MEASURING TAPE	10/06/2018	30/08/2018	BUY-OUT	5	0,057	0,297
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	MODULAR STORAGE SYSTEM 6 DRAWER	10/06/2018	30/08/2018	BUY-OUT	2	0,597	1,197
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	MONITOR VITAL SIGNS (NIBP, SPD2) & TEMP	01/08/2018	23/11/2018	BUY-OUT /STANDARDISE / LIMITED BIDDING	2	35,997	71,997
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	MOP SET	10/06/2018	30/08/2018	BUY-OUT	1	0,237	0,237
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	NEBULISER ULTRASONIC	01/08/2018	23/11/2018	BUY-OUT	1	-0,003	-0,003
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	NURSES STATION COMPLETE AS PER SITE VISIT	01/11/2019	23/02/2019	WCDOH CONTRACT	1	11,997	11,997
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	OVER BED TABLE ABS HEIGHT ADJUSTABLE	N/A - CONTRACT	30/08/2018	RT24-12-021ME	12	1,797	21,597
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	PRINTER / SCANNER COMBO	01/11/2019	23/02/2019	SITA	1	3,597	3,597
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	Q CART LARGE	N/A - CONTRACT	15/12/2018	WCDOH CONTRACT	3	26,397	79,197
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	Q CART LINEN	N/A - CONTRACT	15/12/2018	WCDOH CONTRACT	1	26,397	26,397
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	Q CART SMALL	N/A - CONTRACT	15/12/2018	WCDOH CONTRACT	4	16,797	67,197
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	Q CART SMALL	N/A - CONTRACT	15/12/2018	WCDOH CONTRACT	2	16,797	33,597
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	RECLINER MOBILE	10/06/2018	30/08/2018	BUY-OUT	6	7,197	43,197
A HOSPITAL - HT - NEW EC	CH830052	8,3	VICTORIA HOSPITAL	REGULATOR OXYGEN PIN INDEX	N/A - CONTRACT	30/08/2018	RT4-05-033ME	1	2,397	2,397

Procure how?

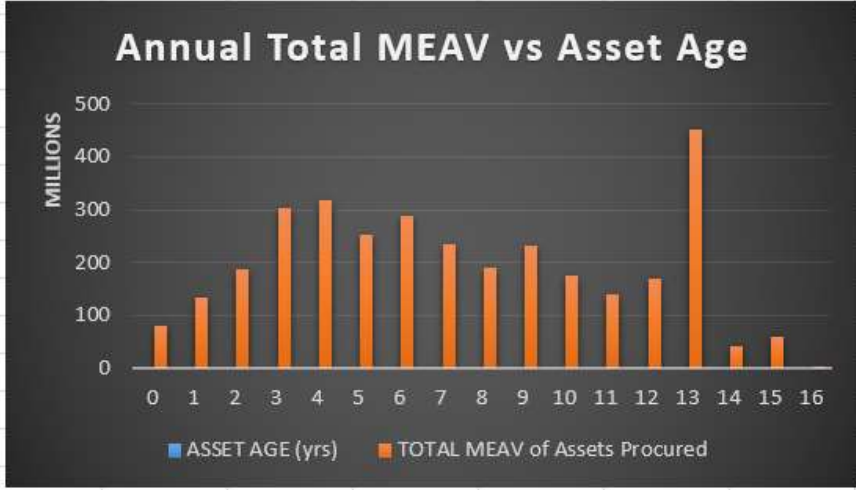
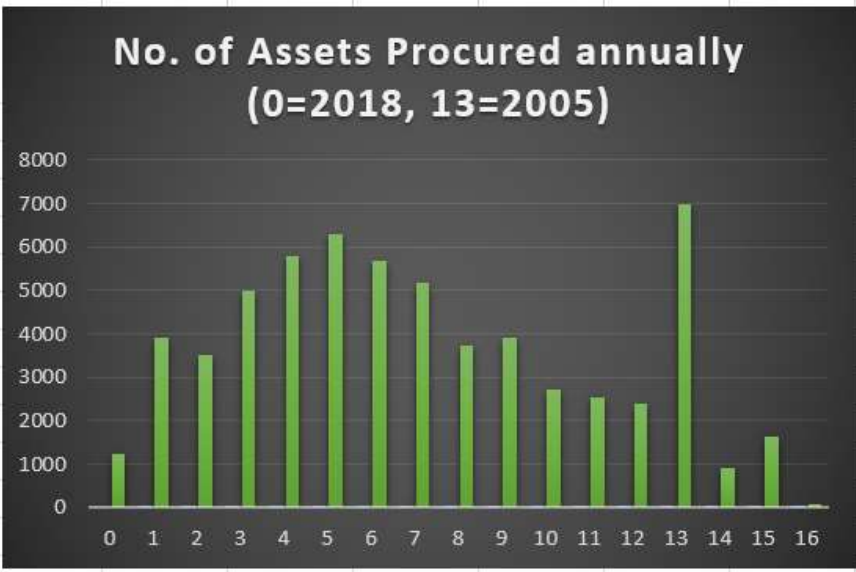
- Bound by rules (PFMA, AOS, grant-specific)
- Driven by 'user' needs – technical specification
- Lowest cost offer that meets specification and other conditions (e.g. local technical support)
- Limited bid to support standardisation
- Pay within 30 days
- Transversal contracts (provincial and national)

ASSET AGE (yrs)	QTY	TOTAL MEAV of Assets Procured	
0	1 236	78 938 583	63 866
1	3 922	132 600 203	33 809
2	3 522	185 523 006	52 675
3	5 012	301 967 033	60 249
4	5 805	318 567 554	54 878
5	6 311	252 217 742	39 965
6	5 694	288 241 568	50 622
7	5 186	233 519 527	45 029
8	3 740	188 559 117	50 417
9	3 904	232 733 742	59 614
10	2 730	175 056 404	64 123
11	2 528	138 484 536	54 780
12	2 415	167 509 609	69 362
13	6 995	451 706 343	64 576
14	933	41 945 873	44 958
15	1 641	58 059 343	35 380
16	95	3 055 021	32 158
17	202	18 838 386	93 259
18	158	4 244 392	26 863
19	588	13 129 545	22 329
20	156	4 852 773	31 108
21	219	6 589 517	30 089
22	129	1 683 378	13 049
23	22	834 081	37 913
24	18	607 411	33 745
25	50	1 202 468	24 049
26	10	919 256	91 926
27	0	0	
28	1	166 223	166 223

Nominal life-time

Expected life-time

Large annual acquisition



Provincial needs and how stakeholders can contribute towards local health technology needs

- Are provincial needs different from national?
- What needs?
 - Must start with healthcare needs but balanced against other needs (systems approach)
- What stakeholders?
 - Local communities, our own staff, other WCG depts., other WC stakeholders incl. academia, industry and NGOs
 - National: NDoH NT DST/TIA Dept of Education/SETAs DTI/IDC DED DPSA etc
 - International: IFMBE, WHO, UNIDO, UNAIDS, PATH, FIND, academia, industry, other NGOs

Provincial needs and how stakeholders can **contribute** towards **local health technology** needs

- What is **'contribute'**?
 - Chicken or pig
- What is **local**?
 - Western Cape – Metro? Rural? PHC up to Tertiary
- What is **HT**?
 - equipment vs devices (IVDs) vs consumables vs drugs vs water and sanitation !

Provincial needs and **how** stakeholders can contribute towards local health technology needs

- Government
 - Enabling environment for innovation (break down silos!); more money (budgetary allocations); Competent, skilled and retained staff
- NDoH
 - Prudent and evidence-based guidelines
Ideal Clinic – AED! IUSS – overdesign
- NT
 - Due diligence and informed decision-making

Provincial needs and **how** stakeholders can contribute towards local health technology needs

- Tertiary institutions
 - broader qualifications (interdisciplinary BME); competent and skilled technologists and technicians
- Prof'l associations
 - promote visionary discourse; codes of practice
- Industry associations
 - maintain standards; codes of practice

Local HT needs

Medical equipment

- smart decision-support systems;
- affordable and appropriate asset management and maintenance systems;
- reliable, durable equipment with both technical and user support;
- new procurement and ownership models
- specialty-specific opportunities (e.g anaes m/c)

Clinical Engineering in Western Cape *

Public sector **

3 tertiary public hospitals in Cape Town:

Groote Schuur Hospital & Red Cross War Memorial Children's Hospital

(both linked to Univ. of Cape Town's Health Sciences Faculty)

Tygerberg Hospital (linked to Univ. of Stellenbosch's HSF)

Each hospital has its own in-house Clin Eng Dept (CED)



(First human heart transplant performed at GSH in 1967)



*<https://www.westerncape.gov.za/dept/health/> (under our Constitution each province functions separately wrt healthcare services); W Cape pop. = circa 6,5-m

**All three major private sector healthcare groups are present in W Cape with in-house Clin Eng expertise (under respective national co-ordinating structures)

Clinical Engineering in Western Cape - II

Public sector

Apart from a minor CE presence at two regional hospitals, all other public sector health facilities* are served by the **Provincial Clinical Engineering Workshop** based in Goodwood, Cape Town Metropole

The workshop generates circa 18,000 job cards a year, does more than 80% of repairs in house and is the only public sector CED that has medical imaging technicians

We have commenced with a CE Internship programme that will help ensure future sustainability, although the challenge nationally is significant, with a current shortfall of 200+ technicians (BMETs)



Goodwood CE Staff

*Numbering almost 500 – from regional & district hospitals to Community Health Centres, and Psychiatric & TB facilities; the Goodwood CEW also supports the WCGH Emergency and Forensic Pathology Services

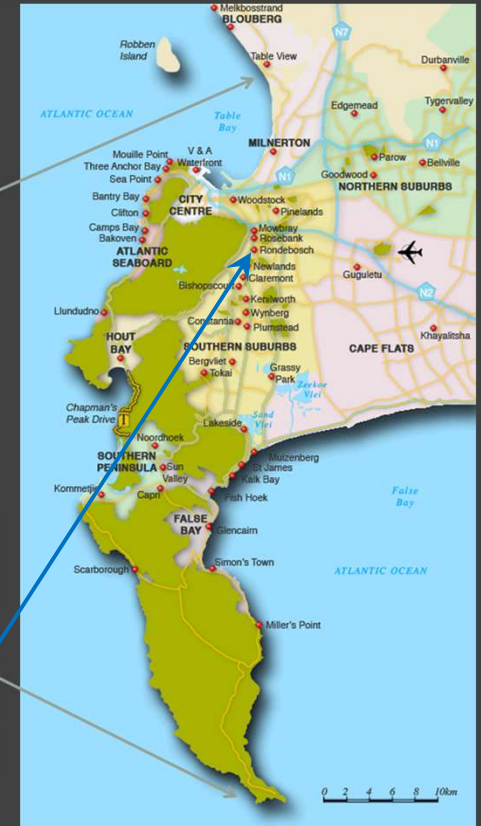
Clinical Engineering Education

Tshwane University of Technology

<https://www.facebook.com/Clinical-Engineering-at-TUT-201194989950818/>

University of South Africa

[https://www.unisa.ac.za/sites/corporate/default/Apply-for-admission/Undergraduate-qualifications/Qualifications/All-qualifications/National-Diploma:-Engineering:-Electrical-Clinical-Engineering-\(NDEEN-%E2%80%93-CEN\)](https://www.unisa.ac.za/sites/corporate/default/Apply-for-admission/Undergraduate-qualifications/Qualifications/All-qualifications/National-Diploma:-Engineering:-Electrical-Clinical-Engineering-(NDEEN-%E2%80%93-CEN))



University of Cape Town

<http://www.bme.uct.ac.za/bme/healthcare-technology-management>



...Thank you for your attention

Global CE Day Oct 21